START2 Superfund Technical Assessment and Response Team 2 - Region VIII

United States
Environmental Protection Agency

Contract No. 68-W-00-118

PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT for TARGETED BROWNFIELDS ASSESSMENT

AGENCY DUMP SITE
Fort Belknap Agency, Fort Belknap Indian Reservation, Montana

TDD No. 0302-0007

APRIL 22, 2004

URS OPERATING SERVICES, INC.

In association with: Tetra Tech EM, Inc.
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LT Environmental, Inc.
TN & Associates, Inc.
TechLaw, Inc.

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PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT

AGENCY DUMP SITE TARGETED BROWNFIELDS ASSESSMENT
Fort Belknap Agency, Blaine County, Montana

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1.0 INTRODUCTION

The Phase II Environmental Site Assessment (ESA) is submitted in accordance with the task elements specified in Technical Direction Document (TDD) #0302-0007 issued to URS Operating Services, Inc. (UOS). The work was conducted by U.S. Environmental Protection Agency (EPA) Region VIII Superfund Technical Assessment and Response Team 2 (START2) under Contract No. 68-W-00-118.

The Fort Belknap Indian Community (FBIC) has requested assistance from the EPA with characterizing environmental conditions at the Agency Dump site, outside Fort Belknap Agency on the Fort Belknap Indian Reservation in Blaine County, Montana (Figure 1). The Agency Dump site was operational during the 1970s and mid 1980s. The dump was used by local residents, tribal entities, the Indian Health Services (IHS) and the Bureau of Indian Affairs (BIA) for disposal purposes. During operation, the dump reportedly received all types of waste. There is concern that the community may be at risk of exposure to unknown substances placed in the dump (Fort Belknap Indian Community (FBIC) 2002). The FBIC is considering options for redevelopment of the site. The Fort Belknap Community Council has proposed a new housing development approximately 0.25 miles north of the Agency Dump site.

This TBA Phase II Environmental Site Assessment (Phase II) Report is designed to be used in conjunction with the Phase I and Field Sampling Plan (Phase I and FSP) prepared for the site. Field activities were conducted from October 5, 2003, through October 9, 2003.

2.0 OBJECTIVES

UOS performed a Phase I in conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E 1527 at the Agency Dump site located near Fort Belknap Agency, Montana (American Society for Testing and Materials (ASTM) 2000). This assessment revealed no evidence of recognized environmental conditions in connection with the property; however, because the dump operated prior to current landfill regulations and a list of waste received at the dump was not maintained, it was determined that a potential for the presence and the migration of hazardous substances may exist on site. Because more information was required to determine if a recognized environmental condition exists on site, Phase II field activities were completed in accordance with ASTM Practice E 1903 to help characterize the site (ASTM 1998). Specifically, the objectives of the Phase II activities are as follows:

- Characterize the presence of any hazardous substances or petroleum products on site that present a material risk of harm to public health or the environment;

- Develop sufficient information to determine, with respect to any recognized environmental conditions assessed, that hazardous substances or petroleum products have not been disposed or released at the property, thereby documenting that the property is suitable for its planned use; and/or

- Develop sufficient information about any recognized environmental condition present at the site to provide sufficient data to assist the Brownfields team in making informed business/environmental decisions regarding the future use of the site.

Recognized environmental conditions are defined in the ASTM E 1903-97 as the presence or likely presence of any hazardous substances or petroleum products on property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate government agencies (ASTM 1998).

The Phase II investigation may consist of several iterations of field sampling and may be terminated at any point, once the objectives of the Brownfields team have been satisfied.

3.0 SITE CHARACTERISTICS

3.1 PHYSICAL GEOGRAPHY

The Agency Dump site is located approximately 1.5 miles south of the Milk River. The Little Rocky Mountains are located to the south of the site. The area between the Milk River and the Little Rocky Mountains is mostly grazing lands and dry land farming. The site is situated in a drainage area that drains into the Milk River (FBIC 2002). The site elevation is approximately 2,481 feet above mean sea level (U.S. Geological Survey (USGS) 1964). The property is currently used as an unofficial dumping ground for debris such as concrete, pipes, and cars. The Agency Dump site is fenced off

except for a gravel road that runs through the property and there is no gate. The road is used to access the water tower used to store drinking water for the town for Fort Belknap Agency. The FBIC is considering redevelopment options for the Agency Dump site (FBIC 2002).

3.2 GENERAL SITE SETTING

The Agency Dump site is located in a rural setting. A graded dirt road leads to the dump site. The dump has been fenced except for the road (with no gate) that is used to obtain access to the Fort Belknap Agency drinking water storage tower that is approximately 1,000 feet upgradient and southwest of the dump (Figure 1). The site consists of several sections: the trench area, the car salvage area, and the surface debris area (URS Operating Services, Inc. (UOS) 2003). The trench area covers approximately seven acres and contains approximately five to six trenches (FBIC 2002). The trenches are reported to be approximately 10 to 15 feet wide and approximately 10 to 15 feet deep with varying lengths (two were approximately 200 feet long) (FBIC 2003a; FBIC 2003b). The trenches have little vegetation; however, the area around the trenches appears to have native vegetation (Photos 3 and 4). The trenches are visible in aerial photographs (Figure 2). The car salvage area is relatively small and is located on the west side of the site. The FBIC Environmental Department reported that these cars were recently placed on the site (FBIC 2003a). Stained soil is visible in this area. The surficial debris area is primarily limited to a drainage area. The surficial debris consists of construction material, 55-gallon drums, and miscellaneous metal debris (Photos 7, 8, and 9). During the site reconnaissance the unburied waste was visually inspected. In addition to the construction debris, a pile of debris with possible asbestos contamination was identified. All of the drums inspected during the site reconnaissance were empty except for one that contained a fine powdery material. The surficial debris area is located between the trenches and the cars salvage area. The Old Agency Landfill, designated as a Brownfields Demonstration Pilot site, and the Milk River are visible from the site (UOS 2003).

Surface drainage from the site flows to the north/northwest toward the Milk River. A portion of the drainage area has been covered with fill and is a possible trench that was used for waste disposal. The fill has been eroded by water flow and has several large depressions and gullies forming (Photos 2 and 6). Waste is not visible in the depressions.

3.3 GEOLOGY

The Fort Belknap Indian Reservation is located in north central Montana. The Milk River Valley, which forms the northern boundary of the reservation, is underlain by recent alluvium from the Milk River. Rising gradually to the south is an undulating glaciated plain broken only by three small syenite porphyry intrusions forming the Snake Butte, Wild Horse Butte, and Twin Buttes. Underlying the glacial till of the plain are Upper Cretaceous shale and sandstone of the Bearpaw and Judith River formations (D. C. Alverson 1965).

3.4 HYDROGEOLOGY

In the area around Fort Belknap Agency, groundwater is obtained from alluvial and glacial deposits of the Milk River Valley and from sand lenses of the Judith River Formation. The alluvial aquifer is underlain by the Judith River Formation, which contributes water to the alluvium. Both aquifers may produce water containing dissolved solids (R. D. Feltis 1983). Water in the Judith River Formation is under water table conditions in some places near the surface, but at depths it is confined beneath relatively impermeable shale (Alverson 1965). The glacial till on the glaciated plains, which varies from a few feet to about 200 feet in thickness, is generally not a dependable source of good quality groundwater. Wells in the Milk Valley yield a small to moderate amount of highly mineralized water, except for shallow wells in sandy alluvium near the Milk River. Deep wells drilled several hundred feet through the alluvium into the Judith River Formation produce enough water for livestock use. This water is generally of poor quality (U.S. Department of Agriculture (USDA) 1986).

Water level data collected during 2000 from three monitoring wells located approximately 0.75 miles north of the site, indicated local groundwater movement to the west under a gradient of approximately 1%. Groundwater levels from this study ranged from approximately 9 feet to 11 feet below the top of casing (toc). The toc was visually estimated to be 3 feet above ground surface (Maxim Technologies, Inc. (Maxim) 2000).

A review of the Montana Bureau of Mines and Geology groundwater well database indicates that these three monitoring wells and one stock water well are located within one mile of the Agency Dump. The total depth of each monitoring wells is between 14 and 19 feet below ground surface

(bgs). The total depth of the stock water well is 220 feet bgs (Montana Bureau of Mines and Geology (MBMG) 2003.

3.5 HYDROLOGY

Ninety-five percent of the land surface on the Fort Belknap Indian Reservation is drained by the Milk River and its four principal intermittent tributaries: Three Mile Creek, White Bear Creek, Peoples Creek, and Beaver Creek. The Milk River is a major tributary to the Missouri River (Ecology and Environment, Inc. (E & E) 1991). Drinking water for the community of Fort Belknap Agency is obtained from the Milk River, northeast of the site (Portage Environmental, Inc. (Portage) 2002).

3.6 METEOROLOGY

The climate of the Fort Belknap Indian Reservation is typical of the semiarid Great Plains region. Temperatures generally range from below zero in winter to the mid-nineties in summer (Alverson 1965). The area receives approximately 12 inches of precipitation annually (Western Regional Climate Center (WRCC) 2003).

4.0 HISTORICAL OWNERSHIP, USE, AND PREVIOUS INVESTIGATIONS

4.1 HISTORICAL OWNERSHIP AND USE

The property is currently used as an unofficial dumping ground for debris such as concrete, pipes, and cars. The Agency Dump site is fenced except for a gravel road that runs through the property and there is no gate. The road is used to access the water tower used to store drinking water for the town for Fort Belknap Agency. The FBIC is considering redevelopment options for the Agency Dump site (FBIC 2002). The title records from the BIA Land Department show that the landfill is on land that has been owned by the FBIC since the formation of the Reservation in 1889. Title records indicate no liens or other encumbrances have been noted (FBIC 2002). The property is not occupied by any businesses or residences (UOS 2003).

4.2 PREVIOUS INVESTIGATIONS

The federal and state environmental databases reviewed during the Phase I indicated that there were no listings of any sites of concern within the area specified. One site, the King's Creek site, was identified without a specific address. The description indicates that the King's Creek site is located near Little Peoples Creek and Hays, Montana, which is at least 20 miles from the Agency Dump site. The nearest community to the site is Fort Belknap Agency, which is approximately one mile northeast of the site. There are no historic Sanborn fire insurance maps available for the area. A Phase I/Phase II Brownfields assessment has been completed at a separate dump site (Old Agency Landfill site) on the Fort Belknap Indian Reservation. The Old Agency Landfill site is located approximately 0.75 miles northwest of the Agency Dump site (between the Agency Dump site and the Milk River) and operated until the early 1960s (Figure 1). The Phase II sampling activities at the Old Agency Landfill site indicated the presence of DDT (highest concentration of 100 parts per million (ppm)), DDE (highest concentration of 5.4 ppm), DDD (highest concentration of 33 ppm), and bis (2-ethylhexyl)phthalate (DEHP) (highest concentration of 7.1 ppm) on site (U.S. Environmental Protection Agency (EPA) 2004). The Fort Belknap Community Council has proposed a new housing development approximately 0.25 miles north of the Agency Dump site (FBIC 2003a; FBIC 2003b).

4.3 CURRENT USES OF THE ADJOINING PROPERTIES

The Agency Dump site is located in a rural largely undeveloped area. The land within 1,000 feet of the dump appears to be undeveloped (UOS 2003). An unpaved but graded road allows access to the site. The small community of Fort Belknap Agency is located approximately one mile northeast of the Agency Dump site (USGS 1964). The Fort Belknap Community Council has proposed a new housing development approximately 0.25 miles north of the Agency Dump site (FBIC 2003).

5.0 SITE ACTIVITIES

The START2 field sampling team consisted of John Noto, Rebecca Mashburn, Paul Schnitz, and Rebecca Laramie. Field work was conducted in Level D Personal Protective Equipment, which included steel-toed boots, nitrile gloves, and ear plugs when appropriate.

The Agency Dump site has been divided into several sections where waste potentially exists: a trench area (Photos 1 through 6), a debris area (Photos 7 through 9), and an auto salvage area. The trench area covers approximately seven acres and is poorly vegetated uneven terrain with a few sink holes present (Figure 2). It is difficult to visually distinguish individual trenches. The debris area is located in ravines to the southwest of the trench area where construction waste, drums, and vehicle parts were dumped. The debris area covers approximately 0.85 acres. The contents in the debris area have not been covered. Finally, an auto salvage area is present west of the debris area. The auto salvage area covers approximately 0.5 acres. During the original site reconnaissance, approximately 15 cars were stacked in this area. During field activities, the cars had been removed; however, broken glass and petroleum stains were visible.

A total 14 surface soil samples were collected from the trench area. In addition, boreholes were completed at eight locations and were monitored using a methane monitor. Because methane was not detected, soil gas samples were not collected. Sampling and monitoring were completed from the trench area to determine if methane or other potential contaminants were migrating to the surface.

Three Geoprobe® boreholes were completed downgradient (north) of the trench area (Photo 11). Specifically, each borehole was completed within a drainage channel leaving the site. A subsurface soil sample was collected from each borehole. The depth of each soil sample is reported in Tables 2a and 3a. Groundwater was not encountered in the boreholes and therefore groundwater samples were not collected. An additional borehole was completed within one of the drainage areas; however, groundwater was not found at this location either. A total of six sediment samples were collected from the site. Sediment samples were collected from the drainage channels leaving the site and from low areas on site that potentially contain surface water runoff during high flow. Because surface water was not encountered on site, samples were only collected from the sediment matrix. One sediment sample was moist and was therefore analyzed for volatile organic compounds (VOCs).

Two source samples (one asbestos sample (AD-SS-AS-01) and one product sample (AD-SS-DM-01)) were also collected during site activities. These samples were collected from the debris area where unknown waste was identified.

Field quality assurance/quality control (QA/QC) samples included the collection of one trip blank and two matrix spike/matrix spike duplicate (MS/MSD) samples were collected for this investigation for laboratory

QA/QC. Table 1 lists the sampling rationale and Figure 2 illustrates the sample locations for this site assessment.

5.1 SUBSURFACE SOIL SAMPLES

Three Geoprobe® boreholes were collected downgradient from the trench area to determine if any contaminant was migrating off-site through groundwater or subsurface gradient flow. Soil cores were field screened for VOC concentrations and the lithology of each core was logged in order to document the characteristics of the subsurface soil material. Boreholes were completed from surface level to approximately 12 feet bgs, where refusal was encountered. From these boreholes, three subsurface soil samples were collected as grab samples. Specific depths are reported in Tables 2a and 3a. Subsurface soil samples were analyzed for Target Analyte List (TAL) total metals, VOCs, semivolatile organic compounds (SVOCs), and pesticides/polychlorinated biphenyls (PCBs). Groundwater was not encountered in the boreholes and therefore groundwater samples were not collected. One additional borehole was completed to attempt to collect groundwater. The borehole was completed to 8 feet bgs and groundwater was not encountered in this borehole either.

5.2 SURFACE SOIL SAMPLES

A total of 19 surface soil samples were collected and submitted to a laboratory and analyzed for TAL total metals, SVOCs, and pesticides/PCBs. A background composite surface sample was collected from an area near the water tower. This area is upgradient of the dump site. Fourteen of the surface soil samples were collected from the trench area. A grid was placed on the trench area. Each grid area covered approximately 1,000 square feet. Five point composite samples were collected from the 13 grid areas that appeared to have the largest areas of disturbance. Thirteen samples (AD-SO-TR-01 through AD-SO-TR-10 and AD-SO-OP-02 through AD-SO-OP-04) were collected using this method. In addition, one sample (AD-SO-TR-11) was collected from a sink hole at the northern edge of the trench area, to determine if any contaminants were present. This sample was collected as a grab sample.

Two composite surface samples (AD-SO-DB-01 and AD-SO-DB-02) were collected from the debris area, west of the trench area. The debris area is geographically divided by a dirt road. The area south of the road contains waste that is generally metal and concrete. The area north of the road

contains 55-gallon drums and general trash. A five-point composite sample was collected from each of these areas to determine if contaminants were present. A grab surface soil sample (AD-SO-OP-01) was also collected from the debris area. This sample was collected from soil under a leaking 55-gallon drum. The soil under the drum was stained with a dark oily substance.

One surface composite sample (AD-SO-AA-01) was collected from the auto salvage area. The sample was collected as a five-point representative composite sample.

5.3 SURFACE WATER AND SEDIMENT SAMPLES

A total of six sediment samples were collected from the site. Five of the sediment samples were collected from drainage channels immediately downgradient of the potential waste areas (Figure 2). One sediment sample was collected from a depression area within the trench area (Photo 10). This depression appeared to store water for a portion of the year. (The depression was holding water during the site reconnaissance but not during the Phase II sampling activities). Sediment samples were submitted to laboratories and analyzed for TAL total metals, SVOCs, and pesticides/PCBs. Because surface water was not encountered on site, samples were only collected from the sediment matrix. One sediment sample was moist and was therefore analyzed for VOCs.

5.4 SOURCE SAMPLES

One sample was collected from a drum with unknown contents (Photos 12 through 14). The sample was field analyzed using a hazardous classification kit. In addition, the sample was sent to the laboratory for VOC, SVOC, pesticide/PCB, and TAL total metals analyses. The drum was open to the environment and the contents consisted of a fine white powder. One asbestos sample was collected from a pile of roofing material observed in the debris area (Photo 15). The roofing material was partially covered; however, asbestos-like fibers were visible.

5.5 FIELD OBSERVATIONS

During field activities, there was no surface water flow from the site. Groundwater was not encountered in any of the Geoprobe® boreholes, which were completed to approximately 12 feet bgs. Geoprobe® boreholes were completed at the lowest locations on site. Several debris areas

contained surficial waste. Most of this waste is in the form of construction debris, drums, and vehicle parts. The trench area (Figure 2) has a minimal amount of surficial waste that includes shoes, cups, small metal objects, etc. The auto salvage area, identified during the site reconnaissance, was void of vehicles during site activities.

6.0 FIELD QUALITY CONTROL PROCEDURES

All samples were handled and preserved as described in UOS Technical Standard Operating Procedure (TSOP) 4.2, "Sample Containers, Preservation and Maximum Holding Times." Calibration of the pH, temperature, and conductivity meters followed instrument manufacturers' instruction manuals and UOS TSOP 4.14, "Water Sample Field Measurements" (UOS 2000).

All sampling equipment was decontaminated prior to initial use. All non-disposable sampling equipment was decontaminated after the collection of each sample in accordance with UOS TSOP 4.11, "Equipment Decontamination." Basic decontamination consisted of washing or brushing gross particulate off sampling equipment with tap water and a scrub brush, followed by washing equipment with a solution of Liquinox® and distilled water, rinsed with distilled water, rinsed with methanol (and/or nitric acid), and finally rinsed with distilled water. After decontamination, the equipment was allowed to gravity drain and then was wrapped in aluminum foil to minimize potential contamination (UOS 2000).

The following samples were collected during the October 2003 sampling event to evaluate quality assurance at the site:

- One trip blank (AD-SW-DR-07) was collected for VOCs analysis.

- Double volume amounts of two soil samples (AD-SO-TR-08 and AD-SO-TR-10) were collected for laboratory MS/MSD purposes.

The "UOS Generic Quality Assurance Project Plan" serves as the primary guide for the integration of QA/QC procedures for the START2 contract (UOS 2001).

7.0 CHAIN OF CUSTODY

After sample collection and identification, all samples were handled in strict accordance with the chain-of-custody protocol specified in UOS TSOP 4.3, "Chain of Custody" (UOS 2000). The chain-of-custody forms are located in Appendix B. Specifically, chain-of-custody forms for samples being analyzed through the EPA Contract Laboratory Program (CLP) were created using the Forms II Lite program, developed for the EPA.

8.0 ANALYTICAL DATA

8.1 VALIDATION

All data analyzed by the CLP laboratories were validated by TechLaw, Inc. All data are acceptable for use as qualified in the data validation report (as reported in Tables 2a, 2b, 2c, 3a, and 3b). The complete data validation reports, and laboratory forms are attached in Appendix B. Data Qualifiers are defined under the corresponding tables.

Concentrations in Tables 2 and 3 are qualified with a J if the numeric value is an estimated quantity. Specifically, those concentrations qualified with a J+ are likely biased high and those concentrations qualified with a J- are likely biased low. Based on the validation report, barium, potassium, vanadium, and cobalt may be biased low (J-) due to negative blank contamination. Silver and arsenic results may be biased low due to negative blank contamination or because the interference check exceeded criteria with a negative ICSA result. Beryllium and cadmium results may be biased low due to negative blank contamination. Lead results may be biased low because interference check criteria were not met. Antimony results may be biased low because interference check exceeded criteria with a negative ICSA result. Selenium, sodium, and thallium results may be biased high because interference check exceeded criteria with a positive ICSA result. Although the validation reports that reviewed DDE and DDT concentrations do not indicate that the estimated values (J) are biased high or biased low, based on the data results, it is likely that the estimates are biased low.

8.2 DATA COMPARISON AND INTERPRETATION

The potential receptors at the site include construction workers (if development is completed in the future), nearby residents, and persons using the area for recreational purposes. The following sections summarize the comparison of analytical results to published guidance, obtained from EPA Region III Risk-Based Concentrations (RBCs) tables, that has been determined to be protective of human health and the environment for given environmental pathways. The RBCs have limitations as follows: they do not consider contamination from soil to air, cumulative risk from multiple contaminants or media, or dermal risk. In addition, many RBCs are based on adult risks. The calculations are the result of the combination of toxicity factors with standard exposure scenarios that produce chemical concentrations corresponding to fixed levels of risk (a Hazard Quotient of 1 or a lifetime cancer risk of one in one million, whichever occurs at a lower concentration). The assumptions used in the standard exposure scenarios can be found on the EPA Region III web page under Technical Background Information (EPA 2002). These standards were developed using protective exposure scenarios and represent concentrations at which the EPA and the state generally would not require a cleanup. Site metal concentrations that exceed the respective RBCs are compared to normal ranges of elemental concentrations in soils of the western United States and can also be compared to the background surface soil sample AD-SO-BK-01 (USGS 1984).

9.0 ANALYTICAL RESULTS

Subsurface soil and sediment samples were analyzed for VOCs, SVOCs, pesticides/PCBs, and TAL metals. Surface soil samples were analyzed for SVOCs, pesticides/PCBs, and TAL metals. Organic samples were analyzed by Ceimic Corporation under the CLP. Inorganic samples were analyzed by Bonner Analytical Testing under CLP.

Concentrations of contaminants detected at levels above published guidelines are noted by a bold font in the tables at the end of this report.

9.1 SUBSURFACE SOIL ANALYTICAL RESULTS

The subsurface soil sample analytical results are reported in Tables 2a and 3a. Analytical results that exceed the RBCs are reported in bold font. All three subsurface soil samples exceeded the RBC

for bis (2-Ethylhexyl) phthalate (DEHP) in residential soil (46 ppm). However sample results were below the RBC for industrial soil (200 ppm). Sample concentrations ranged from 47 J ppm to 59 J ppm. (The "J" indicates that the concentration is estimated.) DEHP is commonly used as a plasticizer in soft plastics. All three subsurface samples had concentrations of arsenic above the respective RBCs and one sample had a concentration of vanadium slightly above the residential RBC (Table 3a). Some RBC concentrations developed by Region III are lower than background concentrations found in the western United States (USGS 1984). The arsenic and vanadium concentrations on site are within normal background concentrations for both the western United States and site-specific background concentrations in sample AD-SO-BK-01.

9.2 SURFACE SOIL ANALYTICAL RESULTS

The surface soil sample analytical results are reported in Tables 2b, 2c, 3a, and 3b. Analytical results that exceed the RBCs are reported in bold font.

One background sample (AD-SO-BK-01) was collected from an area upgradient of the Agency Dump site. This sample had a concentration of arsenic above the industrial (and residential) RBCs. The sample also had a concentration of vanadium slightly below the residential RBC. Both concentrations were within the normal range for western United States soil (USGS 1984).

Six of the surface soil samples collected from the trench area had concentrations of DEHP above the RBC. These results ranged from 49 J ppm to 780 J ppm. In addition, one sample, AD-SO-OP-02, had concentrations of DDE and DDT above the industrial RBCs. As with the subsurface samples, arsenic and vanadium were detected in surface samples from the trench area above the respective RBCs. Three surface samples had concentrations above the vanadium residential RBC and all except one sample had concentrations of arsenic above the industrial RBC. These vanadium and arsenic concentrations are still within the normal background range for soil in the western United States and are not three times above the background sample concentrations associated with sample AD-SO-BK-01 (USGS 1984).

Three samples were collected from the debris area. Sample AD-SO-DB-01 was collected from the southern half of the debris area. This sample had a concentration of arsenic (5.3 ppm) above the industrial RBC; however, this concentration is near the background concentration (3.3 ppm).

Samples AD-SO-DB-02 and AD-SO-OP-01 were collected in the northern half of the debris area. Both samples had concentrations of DEHP above the industrial RBC. Sample AD-SO-DB-02 also had concentrations of chrysene above the industrial RBC and concentrations of DDE and DDT above the residential RBCs. Samples from the debris area also had concentrations of arsenic and vanadium that are above the RBCs but are within the normal range of concentrations for soil in the western United States and are not three times above the background sample concentrations associated with sample AD-SO-BK-01(USGS 1984).

One composite surface soil sample, AD-SO-AA-01, was collected from the auto salvage area. This sample had a concentration of DEHP above the industrial RBC. This sample also had an arsenic concentration above the industrial RBC and a vanadium concentration above the residential RBC. Both concentrations are within the normal range of concentrations for soil in the western United States and are not three times above the background sample concentrations associated with sample AD-SO-BK-01(USGS 1984).

9.3 SEDIMENT ANALYTICAL RESULTS

The sediment sample analytical results are reported in Tables 2a and 3a. Analytical results that exceed the RBCs are reported in bold font. Five sediment samples had concentrations of DEHP that were above the residential RBCs and below the industrial RBCs. Concentrations ranged between 53 J ppm and 120 J ppm. One sample, AD-SE-DP-01, also had a concentration of pentachlorophenol (PCP) (84 J ppm) above the industrial RBC (24 ppm). In addition, all sediment samples had concentrations of arsenic above the industrial RBC. Arsenic concentrations ranged from 2.4 ppm to 7.1 ppm. These concentrations are still below the background concentrations normally found in soil in the western United States and are comparable to the site-specific surface soil background concentration (3.3 ppm) (USGS 1984). Three sediment samples also had concentrations of vanadium slightly above the residential RBC (23 ppm). These concentrations were 27.2 ppm, 34.9 ppm, and 35.7 ppm.

9.4 SOURCE SAMPLES

One asbestos sample (AD-SS-AS-01) was collected from a pile of roofing material observed in the debris area. The roofing material was partially covered; however, asbestos-like fibers were visible. The sample results indicated no asbestos fibers present.

One sample (AD-SS-DM-01) was collected from a drum with unknown contents. The sample was field analyzed using a hazardous classification kit. In addition, the sample was sent to the laboratory for VOC, SVOC, pesticide/PCB, and TAL total metals analysis. The drum was open to the environment and the contents consisted of a fine white powder. Based on the hazardous classification and analytical results the drum is thought to contain sodium carbonate.

10.0 RISK EVALUATION LIMITATIONS

Uncertainties and limitations are inherent in the process of evaluating risk. The level of certainty associated with the conclusions of an evaluation of risk is conditional upon the quality of data and models used to identify chemicals and estimate concentrations, the assumptions made in estimating exposure conditions, and the methods used to develop toxicity factors. Uncertainties in the process could result in an overestimation or underestimation of risk. However, it is standard in risk assessment (per EPA guidance) to require conservative (health protective) assumptions when uncertainty about a particular factor in quantifying risk exists, so as not to underestimate potential risk. Therefore, the risk assessment process is generally skewed toward overestimating rather then underestimating risk. Potential sources of uncertainty related to this specific site include the following:

- Laboratory minimum analytical detection limits, required by the EPA CLP contract, exceeded RBC standards for some chemicals. A non-detect result in a sample therefore does not necessarily ensure that the chemical is absent.

- A grid system was used to determine groundwater, subsurface soil, and surface soil sample locations on the site. This system is useful in discovering “hotspots” when historical data are unavailable to indicate discrete areas of contamination, but does not ensure that hotspots will not be missed.

- QA/QC issues related to analytical data may have biased some concentrations either high or low.

- Comparison of site data to RBCs does not take into account the possibility that the cumulative risk of multiple contaminants, each present in groundwater, soil, or air at concentrations less than their respective RBCs, could still pose an unacceptable risk.

- The RBCs address risk in each environmental medium (water, soil, and air) separately, while an individual may be exposed by more than one pathway. The RBCs do not address dermal risk associated with contaminants. The RBCs do not address risk to ecological receptors (e.g., contaminated groundwater interacting with surface water).

- The RBCs used for comparison at this site are based on conservative, standard assumptions about exposures that may not reflect the actual exposures at the site.

- RBCs are unavailable for six TAL total metal analytes (calcium, lead, magnesium, mercury, potassium, and sodium). Concentrations for these metals are within acceptable residential concentrations when compared to Region 9 PRG values (EPA 2002b). Some RBCs for metal analytes are lower than background concentrations found in the western United States (USGS 1984). Normal ranges of elemental concentrations in soils of the western United States are also reported in Tables 3a and 3b.

11.0 SUMMARY

The FBIC has requested assistance from the EPA with characterizing environmental conditions at the Agency Dump site, outside Fort Belknap Agency on the Fort Belknap Indian Reservation in Blaine County, Montana. The Agency Dump site was operational during the 1970s and mid 1980s. The dump was used by local residents, tribal entities, the IHS and the BIA for disposal purposes. During operation the dump reportedly received all types of waste. There is concern that the community may be at risk to exposure to unknown substances placed in the dump. The FBIC is considering options for redevelopment of the site. The Fort Belknap Community Council has proposed a new housing development approximately 0.25 miles north of the Agency Dump site.

Field activities were conducted from October 5, 2003, through October 9, 2003. The Agency Dump site has been divided into several sections where potential waste may exist; a trench area, a debris area, and an auto salvage area. The trench area covers approximately seven acres and is poorly vegetated uneven terrain, with a few sink holes present. It is difficult to visually distinguish individual trenches. The debris area is located in ravines to the southwest of the trench area where construction waste, drums, and vehicle parts were dumped. The debris area covers approximately 0.85 acres. The contents of the debris area have not been covered. Finally, an auto salvage area is present west of the debris area. During the original site reconnaissance, approximately 15 cars were stacked in this area. During field activities, the cars had been removed; however, broken glass and petroleum stains were visible.

A total of 14 surface soil samples were collected from the trench area. In addition, eight boreholes were completed within the trench area and monitored using a methane monitor. Because methane was not detected, soil gas samples were not collected. Sampling and monitoring were completed in the trench area to determine if methane or other potential contaminants were migrating to the surface.

Three Geoprobe® boreholes were completed downgradient (north) of the trench area. Specifically each borehole was completed within a drainage channel leaving the site. A subsurface soil sample was collected from each borehole. Groundwater was not encountered in the boreholes and therefore groundwater samples were not collected. An additional borehole was completed within one of the drainage areas; however, groundwater was not found at this location either. A total of six sediment samples were collected from the site. Sediment samples were collected from the drainage channels leaving the site in addition to low areas on site that potentially contain surface water runoff during high flow. Because surface water was not

encountered on site, samples were only collected from the sediment matrix. One sediment sample was moist and was therefore also analyzed for VOCs.

Two source samples (one asbestos sample and one product sample) were also collected during site activities. These samples were collected from the debris area where unknown waste was identified. The asbestos sample was non detect for asbestos fibers and the drum is thought to contain sodium carbonate, based on analytical and field screening techniques.

Many of the samples from a solid matrix (subsurface, surface, and sediment samples) contained concentrations of DEHP above the residential RBC. Two of the surface soil samples from the debris area (AD-SO-DB-02 and AD-SO-OP-01), the sample from the auto salvage area (AD-SO-AA-01), and one sample from the trench area (AD-SO-TR-01) had concentrations of DEHP above the industrial RBC. One sample (AD-SO-DB-02) had a concentration of chrysene above the industrial RBC and sample AD-SE-DP-01 had a concentration of PCP above the industrial RBC. Samples AD-SE-DR-01 and AD-SE-DR-02 were collected downgradient of sample AD-SE-DP-01 and were both non detect for PCP. One surface soil sample from the trench area (AD-SO-OP-02) and one surface soil sample from the debris area (AD-SO-DB-02) had concentrations of DDE and DDT above the RBCs. Although many of the soil samples had concentration of arsenic and vanadium above the respective RBCs, the concentration were within the normal range for soils in the western United States (USGS 1984).

12.0 RECOMMENDATIONS

Concentrations of DEHP, chrysene, PCP, DDE, and DDT were detected in surface soil samples above the respective RBCs. It is undetermined if additional contamination may be present below the surface or in areas that were not sampled. In addition, the quantity and type of chemicals placed in the landfill are not known. Although many of the soil samples had concentrations of arsenic and vanadium above the respective RBCs, the concentrations were within the normal range for soils in the western United States (USGS 1984).

Because groundwater samples could not be obtained during field activities, installation of groundwater monitoring wells is recommended to assess the potential for contaminants to migrate to the groundwater. Groundwater monitoring wells should be placed downgradient of the site to determine if potential contamination is migrating from the site. In addition, it may be helpful to collect several subsurface soil samples for geotechnical analysis including soil permeability. This will help determine the likelihood of contaminant migration to the groundwater.

If the site is not developed, access to the site should be limited. This may include placing gates at the entrances to the site and posting signs to restrict access. If groundwater is sampled and found to be contaminated, additional remediation may also be needed to remove the contaminant source and to address contamination in groundwater.

If the site is developed or left accessible, all surficial debris should be removed or covered for physical safety reasons. Areas of soil contamination above acceptable levels should be removed and appropriately treated or disposed of. If the site is developed, the trench area should be re-graded to a topography appropriate for the end use. Special attention should be paid to designing surface drainage to reduce the risk of forming sink holes and drainage gullies and to direct surface drainage upgradient of the site away from the trench area. Additional samples should be collected after regrading and/or removal of contaminated soil to ensure that remaining soil contaminant concentrations are acceptable for the planned use of the property, or additional fill should be placed in areas with elevated concentrations of chemicals. The acceptable levels of contaminant concentrations that remain at the site will depend on the end use of the property (e.g., commercial/industrial, park, grazing land, or return to natural state).

13.0 LIST OF REFERENCES

American Society for Testing and Materials (ASTM). 1998. Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process with ASTM Designation: E 1903-97 and dated December 10, 1997 (approved), and February 1998 (published).

American Society for Testing and Materials (ASTM). 2000. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. ASTM Designation: E 1527-00. July 2000.

Alverson, D. C. 1965. Geology and Hydrology of the Fort Belknap Indian Reservation Montana, USGS Water Supply Paper 1576-5. Washington D.C.

Ecology and Environment, Inc. (E&E). 1991. Transmittal of the final Site Inspection Report for the Old Agency Landfill site. TDD F08-0-12-05.

Feltis, R. D. 1983. Groundwater Resources, Fort Belknap Indian Reservation, North Central Montana, Montana Bureau of Mines and Geology, Memoir 53.

Fort Belknap Indian Community (FBIC). 2002. Targeted Brownfields Assessment Grant Application. October 3, 2002.

Fort Belknap Indian Community (FBIC). 2003a. Conversations between Sherry Bishop, FBIC Environmental Department, and Rebecca Laramie, START2. July 1, 2003.

Fort Belknap Indian Community (FBIC). 2003b. E-mail from Sherry Bishop, FBIC Environmental Department to Rebecca Laramie documenting interviews completed with Fort Belknap Agency residents.

Maxim Technologies, Inc. 2000. Old Agency Landfill Environmental Assessment Report, Fort Belknap Reservation, Blaine County, Montana.

Montana Bureau of Mines and Geology (MBMG). 2003. Groundwater Information Center Well Reports. August 4, 2003.

Portage Environmental, Inc. 2002. Phase I Environmental Site Assessment, Old Agency Landfill, Fort Belknap Indian Reservation, Montana. August 2002.

U.S. Department of Agriculture (USDA). 1986. Soil Survey of Blaine County and part of Phillips County Montana. Soil Conservation Serv ice.

U.S. Environmental Protection Agency (EPA). 1996. Soil Screening Guidance: User's Guide.

U.S. Environmental Protection Agency (EPA). 1998. Quality Assurance Guidance for Conducting Brownfields Site Assessments.

U.S. Environmental Protection Agency (EPA). 2002a. EPA Region III Risk Based Concentrations from http://www.epa.gov/reg3hwmd/risk/index.htm.

U.S. Environmental Protection Agency (EPA). 2002b. EPA Region IX Preliminary Remediation Goals (PRGs) ("For Planning Purposes"). http://www.epa.gov/Region9/waste/sfund/prg/index.htm October 01, 2002.

U.S. Environmental Protection Agency (EPA). 2004. Conversation of Rebecca Laramie/UOS with Stephanie Wallace/EPA about the Phase II that was conducted at the Old Agency Landfill site. Feb. 2004.

U.S. Geological Survey (USGS). 1964. Topographical Map, Fort Belknap Agency.

U.S. Geological Survey (USGS). 1984. Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States by Hansford T. Shacklette and Josephine G. Boerngen. USGS Professional Paper 1270.

URS Operating Services, Inc. (UOS). 2000. UOS Technical Operating Procedures (TSOPs) for Field Operations at Hazardous Waste Sites.

URS Operating Services, Inc. (UOS). 2001. UOS Generic Quality Assurance Project Plan for the Superfund Technical Assessment and Response Team. EPA Region VIII. February 28, 2001.

URS Operating Services, Inc. (UOS). 2003. Log book notes from the Site Reconnaissance and field activities.

Western Regional Climate Center. (WRCC). 2003. Climatic Data. www.wrcc.dri.edu August 2003.

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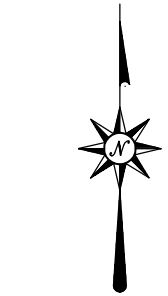
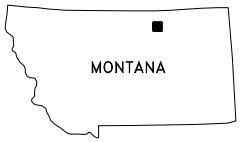
URS Operating Services, Inc.
START2, EPA Region VIII
Contract No. 68-W-00-118

Agency Dump TBA
Revision: 0
Date: 08/2003





QUADRANGLE LOCATION

Source: USGS 7.5' Quadrangle
Fort Belknap Agency, 1964

2000 0 2000

SCALE: 1" = 2000'

Phase I and FSP

TDD No. 0302-0007

Agency Dump TBA
Fort Belknap Agency, Montana

Site Location Map

Figure 1

August 2003

URS OPERATING SERVICES

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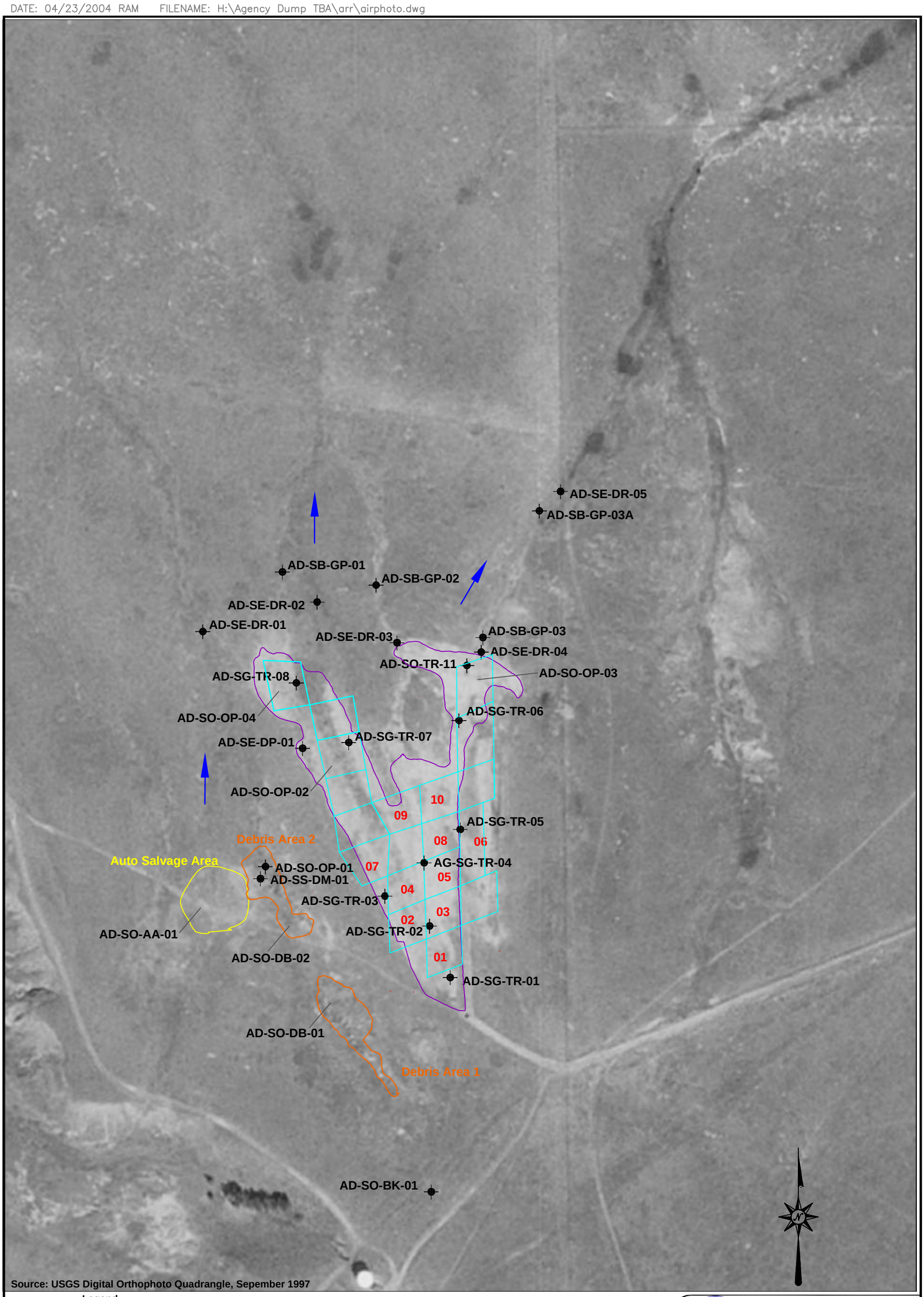

Legend

AD-SO-TR-01 through 10	##	Composite Surface Soil Samples
AD-SB-GP-01, 02, 03, 03A		Depth Soil Samples
AD-SE-DR-01 through 05		Drainage Sediment Samples
AD-SE-DP-01		Depression Sediment Sample
AD-SS-DM-01		Drum Source Sample
AD-SG-TR-01 through 08		Soil Gas Samples
		Potential Surface Water Drainage
AD-SO-OP-01 through 04		Opportunity Soil Samples
AD-SO-DB-01, 02		Debris pile composite surface soil sample
AD-SO-AA-01		Auto salvage area composite surface soil sample

250 0 250

SCALE: 1" = 250'

Phase II

TDD No. 0302-0007

Agency Dump TBA
Fort Belknap Agency, Montana

Sample Location Map

Figure 2

April 2004

URS OPERATING SERVICES

TABLE 1
Sample Locations and Rationale

Sample Number	Sample Location	Sample Rationale
AD-SO-BK-01	Background surface soil sample collected from similar geologic terrain as dump location	To establish background soil concentrations.
AD-SO-TR-01	Composite surface soil sample collected from the trench area.	To determine if surface soil at the dump is contaminated.
AD-SO-TR-02	Composite surface soil sample collected from the trench area.	To determine if surface soil at the dump is contaminated
AD-SO-TR-03	Composite surface soil sample collected from the trench area.	To determine if surface soil at the dump is contaminated
AD-SO-TR-04	Composite surface soil sample collected from the trench area.	To determine if surface soil at the dump is contaminated
AD-SO-TR-05	Composite surface soil sample collected from the trench area.	To determine if surface soil at the dump is contaminated
AD-SO-TR-06	Composite surface soil sample collected from the trench area.	To determine if surface soil at the dump is contaminated
AD-SO-TR-07	Composite surface soil sample collected from the trench area.	To determine if surface soil at the dump is contaminated
AD-SO-TR-08	Composite surface soil sample collected from the trench area.	To determine if surface soil at the dump is contaminated
AD-SO-TR-09	Composite surface soil sample collected from the trench area.	To determine if surface soil at the dump is contaminated
AD-SO-TR-10	Composite surface soil sample collected from the trench area.	To determine if surface soil at the dump is contaminated
AD-SO-TR-11	Grab soil sample collected from trench area where erosion is occurring.	To determine if soil at the dump is contaminated
AD-SO-DB-01	Composite soil sample collected from debris area.	To determine if soil at the dump is contaminated
AD-SO-DB-02	Composite soil sample collected from debris area.	To determine if soil at the dump is contaminated

TABLE 1
Sample Locations and Rationale
(continued)

Sample Number	Sample Location	Sample Rationale
AD-SO-AA-01	Composite soil sample collected from auto salvage area.	To determine if soil at the dump is contaminated
AD-SO-OP-01	Opportunity soil sample collected from debris area, under a 55-gallon drum	To determine if soil at the dump is contaminated
AD-SO-OP-02	Opportunity soil sample. Composite sample collected from trench area	To determine if soil at the dump is contaminated
AD-SO-OP-03	Opportunity soil sample. Composite sample collected from trench area	To determine if soil at the dump is contaminated
AD-SO-OP-04	Opportunity soil sample. Composite sample collected from trench area	To determine if soil at the dump is contaminated
AD-SB-GP-01	Soil boring sample downgradient of the trench area,	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SB-GP-02	Soil boring sample downgradient of the trench area.	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SB-GP-03	Soil boring sample downgradient of trench area.	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SS-AS-01	Asbestos sample from surface debris area.	Determine is asbestos material is located on site
AD-SS-DM-01	Source sample collected from contents of an unlabeled drum in the surface debris area.	Determine contents of drum.
AD-SW-DR-01 (MS/MSD)	Surface water sample collected from drainage off site. **Not collected**	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site. The MS/MSD is collected to test the precision of laboratory analytical methods.
AD-SW-DR-02	Surface water sample collected from drainage off site. **Not collected**	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.

TABLE 1
Sample Locations and Rationale
(continued)

Sample Number	Sample Location	Sample Rationale
AD-SW-DR-03	Surface water sample collected from drainage off site. **Not collected**	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SW-DR-04	Surface water sample collected from drainage off site. **Not collected**	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SW-DR-05	Surface water sample collected from drainage off site. **Not collected**	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SW-DP-01	Surface water sampled from a depression located on site **Not collected**	To determine if contaminants are present on the surface of the Dump site.
AD-SE-DR-01	Sediment sample collected from drainage off site. Collocated with surface water sample AD-SW-DR-01.	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SE-DR-02	Sediment sample collected from drainage off site. Collocated with surface water sample AD-SW-DR-02.	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SE-DR-03	Sediment sample collected from drainage off site. Collocated with surface water sample AD-SW-DR-03.	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SE-DR-04	Sediment sample collected from drainage off site. Collocated with surface water sample AD-SW-DR-04.	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SE-DR-05	Sediment sample collected from drainage off site. Collocated with surface water sample AD-SW-DR-05.	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SE-DP-01	Sediment sample from a depression located on site. Collocated with surface water sample AD-SE-DP-01.	To determine if contaminants are present on the surface of the Dump site.
AD-SG-TR-01	Soil gas sample from the trench area. **Not collected**	To determine if methane is present at the Agency Dump site.

TABLE 1
Sample Locations and Rationale
(continued)

Sample Number	Sample Location	Sample Rationale
AD-SG-TR-02	Soil gas sample from the trench area. **Not collected**	To determine if methane is present at the Agency Dump site.
AD-SG-TR-03	Soil gas sample from the trench area. **Not collected**	To determine if methane is present at the Agency Dump site.
AD-SG-TR-04	Soil gas sample from the trench area. **Not collected**	To determine if methane is present at the Agency Dump site.
AD-GW-GP-01	Groundwater sample collected downgradient of the site. **Not collected**	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-GW-GP-02	Groundwater sample collected downgradient of the site. **Not collected**	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-GW-GP-03	Groundwater sample collected downgradient of the site. **Not collected**	To determine if contaminants potentially attributable to the Agency dump are migrating off of the site.
AD-SW-DR-06	Duplicate of a surface water sample (to be determined in the field). **Not collected**	Document the precision of sample collection procedures and laboratory analyses.
AD-SW-DR-07	Trip Blank	Document potential for contamination via transport.

TABLE 2a
Organic Sample Results
Concentrations in mg/kg (ppm)

Sample ID#: Lab Sample ID: Location:	EPA Region III RBCs (October 2003)		AD-SB-GP-01 H10B8 Downgradient (north) of trench area 10 feet bgs	AD-SB-GP-02 H10B9 Downgradient (north) of trench area 11 feet bgs	AD-SB-GP-03 H10C0 Downgradient (north) of trench area 14 feet bgs	AD-SE-DP-01 H10C1 Depression in NW portion of trench area	AD-SE-DR-01 H10C2 drainage NW of trench area	AD-SE-DR-02 H10C3 Drainage N of trench area collocated with AD-SB-GP-01	AD-SE-DR-03 H10C4 Drainage N of trench area collocated with AD-SB-GP-02	AD-SE-DR-04 H10C5 Drainage N of trench are collocated with AD-SB-GP-03	AD-SE-DR-05 H10C6 Drainage N of trench area NE of AD-SE-DR-04	AD-SW-DR-06 H10E7 Aqueous Trip Blank
	Soil											
	Industrial	Residential										
Volatile Organic Compounds (VOCs)												
Acetone	92,000 N	70,000 N	13	20	16	NA	NA	NA	22	NA	NA	7 J
Toluene	200,000 N	16,000 N	12 U	2 J	12 U	NA	NA	NA	14 U	NA	NA	10 U
Carbon Disulfide	100,000 N	7,800 N	12 U	14 U	12 U	NA	NA	NA	14 U	NA	NA	10 U
Semivolatile Organic Compounds (SVOCs)												
Di-n-octylphthalate	20,000 N	1,600 N	390 U	400 U	410 U	350 U	340 U	340 U	630 U	340 U	350 U	NA
bis (2-Ethylhexyl)phthalate	200 C	46 C	**47 J**	**51 J**	**59 J**	**86 J**	**53 J**	**65 J**	**120 J**	**120 J**	38 J	NA
Pentachlorophenol	24 C	5.3 C	980 U	1,000 U	1,000 U	**84 J**	850 U	840 U	1,600 U	860 U	880 U	NA
Butylbenzylphthalate	200,000 N	16,000 N	390 U	400 U	410 U	350 U	340 U	340 U	630 U	340 U	350 U	NA
Chrysene	390 C	87 C	390 U	400 U	410 U	350 U	340 U	340 U	630 U	340 U	350 U	NA
Pesticides/Polychlorinated Biphenyls (Pest/PCBs)												
4,4'-DDE	8.4 C	1.9 C	3.9 U	4.0 U	4.1 U	3.5 UJ	3.3 U	3.3 U	6.2 UJ	3.4 U	3.5 U	NA
4,4'-DDT	8.4 C	1.9 C	3.9 U	4.0 U	4.1 U	3.5 UJ	3.3 U	3.3 U	6.2 UJ	3.4 U	3.5 U	NA

J The associated numerical value is an estimated quantity because the Quality Control criteria were not met.
UJ The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound was not detected.
U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit
NA Not analyzed.
RBCs Risk Based Concentrations
C Carcinogenic effects
N Noncarcinogenic effects
Bold Analytical results that exceed the RBCs.

TABLE 2b
Soil Organic Sample Results
Concentrations in mg/kg (ppm)

Sample ID#: Lab Sample ID: Location:	EPA Region III RBCs (October 2003)		AD-SO-BK-01 H10C8 Background Surface Soil Sample	AD-SO-DB-01 H10C9 Composite sample from debris area	AD-SO-DB-02 H10D0 Composite sample from debris area	AD-SS-DM-01 H10E6/RE	AD-SO-AA-01 H10C7 Composite sample from auto salvage area	AD-SO-OP-01 H10D1 Grab sample from debris area under a 55-gallon drum	AD-SO-OP-02 H10D2 Composite sample from trench area	AD-SO-OP-03 H10D3 Composite sample from trench area	AD-SO-OP-04 H10D4 Composite sample from trench area
	Soil										
	Industrial	Residential									
Volatile Organic Compounds (VOCs)											
Acetone	92,000 N	70,000 N	NA	NA	NA	31 U	NA	NA	NA	NA	NA
Toluene	200,000 N	16,000 N	NA	NA	NA	31 U	NA	NA	NA	NA	NA
Carbon Disulfide	100,000 N	7,800 N	NA	NA	NA	8 J	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)											
Di-n-octylphthalate	20,000 N	1,600 N	340 U	340 U	860 J	130,000 U	1,700 U	78,000 U	350 U	380 U	340 U
bis (2-Ethylhexyl)phthalate	200 C	46 C	340 U	340 U	**1,200 J**	130,000 U	**570 J**	**8,900 J**	350 U	380 U	350 U
Pentachlorophenol	24 C	5.3 C	860 U	850 U	25,000 U	310,000 U	4,200 U	200,000 U	870 U	960 U	840 U
Butylbenzylphthalate	200,000 N	16,000 N	340 U	340 U	10,000 U	130,000 U	250 J	78,000 U	350 U	380 U	340 U
Chrysene	390 C	87 C	340 U	340 U	**750 J**	130,000 U	1,700 U	78,000 U	350 U	380 U	340 U
Pesticides/Polychlorinated Biphenyls (Pest/PCBs)											
4,4'-DDE	8.4 C	1.9 C	3.4 U	3.3 U	**4.7 J**	7.1 U	3.3 U	3.3 U	**15**	3.9 U	3.3 U
4,4'-DDT	8.4 C	1.9 C	3.4 U	3.3 U	**7.4 J**	7.1 U	3.3 U	3.3 U	**9.1**	3.9 U	3.3 U

J The associated numerical value is an estimated quantity because the Quality Control criteria were not met.
U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit
NA Not analyzed.
RBCs Risk Based Concentrations
C Carcinogenic effects
N Noncarcinogenic effects
Bold Analytical results that exceed the RBCs.

TABLE 2c
Soil Organic Sample Results
Concentrations in mg/kg (ppm)

Sample ID#: Lab Sample ID: Location:	EPA Region III RBCs (October 2003)		AD-SO-TR-01 H10D5 Composite sample from trench area	AD-SO-TR-02 H10D6 Composite sample from trench area	AD-SO-TR-03 H10D7 Composite sample from trench area	AD-SO-TR-04 H10D8 Composite sample from trench area	AD-SO-TR-05 H10D9 Composite sample from trench area	AD-SO-TR-06 H10E0 Composite sample from trench area	AD-SO-TR-07 H10E1 Composite sample from trench area	AD-SO-TR-08 H10E2 Composite sample from trench area	AD-SO-TR-09 H10E3 Composite sample from trench area	AD-SO-TR-10 H10E4 Composite sample from trench area	AD-SO-TR-11 H10E5 Composite sample from trench area
	Soil												
	Industrial	Residential											
Volatile Organic Compounds (VOCs)													
Acetone	92,000 N	70,000 N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	200,000 N	16,000 N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Disulfide	100,000 N	7,800 N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)													
Di-n-octylphthalate	20,000 N	1,600 N	10,000 U	340 U	330 U	67 J	350 U	460 U	340 U	340 U	340 U	330 U	350 U
bis (2-Ethylhexyl)phthalate	200 C	46 C	**780 J**	340 U	330 U	**130 J**	**82 J**	**49 J**	**53 J**	**150 J**	340 U	330 U	350 U
Pentachlorophenol	24 C	5.3 C	25,000 U	840 U	840 U	870 U	890 U	1,200 U	850 U	850 U	840 U	830 U	870 U
Butylbenzylphthalate	200,000 N	16,000 N	10,000 U	340 U	330 U	350 U	350 U	460 U	340 U	340 U	340 U	330 U	350 U
Chrysene	390 C	87 C	10,000 U	340 U	330 U	350 U	350 U	460 U	340 U	340 U	340 U	330 U	350 U
Pesticides/Polychlorinated Biphenyls (Pest/PCBs)													
4,4'-DDE	8.4 C	1.9 C	3.4 U	3.3 U	3.4 UJ	3.5 U	3.5 U	4.5 U	3.4 U	3.4 U	3.4 U	3.3 U	3.5 U
4,4'-DDT	8.4 C	1.9 C	3.4 U	3.3 U	3.4 UJ	3.5 U	3.5 U	4.5 U	3.4 U	3.4 U	3.4 U	3.3 U	3.5 U

J The associated numerical value is an estimated quantity because the Quality Control criteria were not met.
UJ The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound was not detected.
U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit
NA Not analyzed.
RBCs Risk Based Concentrations
C Carcinogenic effects
N Noncarcinogenic effects
Bold Analytical results that exceed the RBCs.

TABLE 3a
Inorganic Soil Sample Results
Concentrations in mg/kg (ppm)

Sample ID: Lab Sample ID: Location: Analyte (Abbrev)	EPA Region III RBCs (October 2003)		Background Concentration Ranges in the Western United States (USGS 1984)	AD-SB-GP-01 MH10B8 Subsurface Soil Sample Downgradient of Trench 10 feet bgs	AD-SB-GP-02 MH10B9 Subsurface Soil Sample Downgradient of Trench 11 feet bgs	AD-SB-GP-03 MH10C0 Subsurface Soil Sample Downgradient of Trench 14 feet bgs	AD-SE-DP-01 MH10C1 Sediment sample from Depression Area	AD-SE-DR-01 MH10C2 Sediment sample from Drainage Channel	AD-SE-DR-02 MH10C3 Sediment sample from Drainage Channel	AD-SE-DR-03 MH10C4 Sediment sample from Drainage Channel	AD-SE-DR-04 MH10C5 Sediment sample from Drainage Channel	AD-SE-DR-05 MH10C6 Sediment sample from Drainage Channel	AD-SO-AA-01 MH10C7 Composite Soil Sample from Auto Salvage Area	AD-SO-BK-01 MH10C8 Background Sample	AD-SO-DB-01 MH10C9 Composite Sample from Debris Area	AD-SO-DB-02 MH10D0 Composite Sample from Debris Area	AD-SO-OP-01 MH10D1 Grab Sample from Debris Area, under 55-gallon Drum
	Soil																
	Industrial	Residential															
Aluminum (Al)	1,000,000 N	78,000 N	29,000 - 116,000	9,030	11,600	13,500	12,000	7,340	5,760	17,400	4,470	14,400	10,500	8,350	7,510	13,200	12,100
Antimony (Sb)	410 N	31 N	0.22 - 1.01	13.8 UJ	14.3 UJ	14.8 UJ	12.6 UJ	12.2 UJ	12.3 UJ	23.0 UJ	12.5 UJ	13.1 UJ	12.3 UJ	12.3 UJ	12.2 UJ	12.4 UJ	12.3 UJ
Arsenic (As)	1.9 C	0.43 C	2.8 - 10.9	**8.0**	**10.0**	**4.9**	**6.5**	**3.5 J-**	**3.2**	**7.1**	**2.4 J-**	**6.5**	**4.5**	**3.3**	**5.3**	**6.5**	**5.9**
Barium (Ba)	72,000 N	5,500 N	337 - 998	117	138	183	215	106	80.8	153	242	245	276	310	161	293	266
Beryllium (Be)	2,000 N	160 N	0.3 - 1.56	0.48 J-	0.66 J-	0.64 J-	0.65 J-	0.32 J-	0.28 J-	1.1 J-	0.24 J-	0.84 J-	0.38 J-	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium (Cd)	510 N	39 N	0.01 - 2.0	0.10 J-	0.15 J-	0.16 J-	0.21 J-	0.14 J-	0.12 J-	0.19 J-	0.03 J-	0.19 J-	0.36 J-	1.0 U	1.0 U	1.0 U	1.0 U
Calcium (Ca)				26,000	17,500	18,400	21,200	2,170	2,330	10,500	22,300	11,700	6,380	5,980	16,100	16,200	16,500
Chromium (Cr)			91 - 90	14.1	18.1	18.4	15.8	9.4	8.1	24.0	9.3	22.8	14.2	10.7	10.9	16.7	15.4
Cobalt (Co)	20,000 N	1,600 N	3.6 - 14	9.9 J	13.5	11.9 J	8.8 J	10.2 U	10.2 U	19.1 U	10.4 U	12.6	10.2 U	10.2 U	10.1 U	10.3 U	10.3 U
Copper (Cu)	41,000 N	3,100 N	10 - 43	17.3	28.6	30.8	17.3	7.1	7.6	20.8	4.5 J	17.5	12.2	5.5	8.3	17.2	14.8
Iron (Fe)	310,000 N	23,000 N	10,600 - 41,000	15,200	18,500	20,800	19,200	10,300	8,680	26,700	8,980	22,600	12,500	8,480	13,500	17,100	15,000
Lead (Pb)			9 - 31	10.5	10.8	10.7	10.4	6.7	5.7	14.3	3.7	11.7	34.0	6.9	7.6	28.6	47.8
Magnesium (Mg)				13,200	8,670	11,800	9,660	2,390	2,150	8,110	11,800	8,900	4,620	2,910	7,560	7,130	7,430
Manganese (Mn)	20,000 N	1,600 N	192 - 752	495	369	556	484	299	251	503	270	563	342	144	317	459	330
Mercury (Hg)			0.02 - 0.11	0.065 J	0.057 J	0.071 J	0.062 J	0.038 J	8.2 U	0.075 J	0.10 U	0.060 J	0.035 J	0.031 J	0.041 J	0.050 J	0.039 J
Nickel (Ni)	20,000 N	1,600 N	7 - 32	29.6	31.9	30.9	21.9	9.3	7.9 J	30.7	11.3	28.3	12.2	10.7	13.1	20.6	15.2
Potassium (K)				1,810	2,260	2,550	2,840	1,850	1,580	2,840	1,650	3,170	1,780	1,610	1,730	2,510	1,880
Selenium (Se)	5,100 N	390 N	0.09 - 0.56	8.0 U	8.3 U	8.6 U	7.3 U	7.1 U	7.2 U	13.4 U	7.3 U	7.7 U	7.2 U	7.2 U	7.1 U	7.2 U	7.2 U
Silver (Ag)	5,100 N	390 N	0.01 - 8	2.3 UJ	2.4 UJ	2.5 UJ	2.1 UJ	2.0 UJ	2.0 UJ	3.8 UJ	2.1 U	2.2 UJ	2.0 UJ	2.0 U	2.0 UJ	2.1 UJ	2.1 UJ
Sodium (Na)				3,540	4,510	5,440	1,050 U	1,020 U	1,020 U	1,920 U	1,040 U	1,100 U	1,020 U	1,020 U	1,020 U	1,030 U	1,030 U
Thallium (Tl)	72 N	5.5 N	0.1 - 0.8	5.7 U	6.0 U	6.2 U	5.2 U	5.1 U	5.1 U	9.8 U	5.2 U	5.5 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
Vanadium (V)	310 N	23 N	36 - 136	19.7	22.4	**24.6**	**27.2**	19.3	16.3	**34.9**	15.9	**35.7**	**25.2**	20.5	20.8	**33.3**	**29.4**
Zinc (Zn)	310,000 N	23,000 N	31 - 98	59.4	72.5	75.9	104	35.5	33.6	91.9	29.0	80.2	73.2	33.5	43.3	155	973

J	The associated numerical value is an estimated quantity and is the approximate concentration of the analyte in the sample
J+	The associated numerical value is an estimated quantity but the result may be biased high.
J-	The associated numerical value is an estimated quantity but the result may be biased low.
UJ	The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound may or may not be present in the sample
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit of the sample detection limit.
RBCs	Risk Based Concentrations
C	Carcinogenic effects
N	Noncarcinogenic effects
Bold	Analytical results that exceed the RBCs.

TABLE 3b
Inorganic Soil Sample Results
Concentrations in mg/kg (ppm)

Sample ID: Lab Sample ID: Location: Analyte (Abbrev)	EPA Region III RBCs (October 2003)		Background Concentration Ranges in the Western United States (USGS 1984)	AD-SO-OP-02 MH10D2 Composite Sample from Trench Area	AD-SO-OP-03 MH10D3 Composite Sample from Trench Area	AD-SO-OP-04 MH10D4 Composite Sample from Trench Area	AD-SO-TR-01 MH10D5 Composite Sample from Trench Area	AD-SO-TR-02 MH10D6 Composite Sample from Trench Area	AD-SO-TR-03 MH10D7 Composite Sample from Trench Area	AD-SO-TR-04 MH10D8 Composite Sample from Trench Area	AD-SO-TR-05 MH10D9 Composite Sample from Trench Area	AD-SO-TR-06 MH10E0 Composite Sample from Trench Area	AD-SO-TR-07 MH10E1 Composite Sample from Trench Area	AD-SO-TR-08 MH10E2 Composite Sample from Trench Area	AD-SO-TR-09 MH10E3 Composite Sample from Trench Area	AD-SO-TR-10 MH10E4 Composite Sample from Trench Area	AD-SO-TR-11 MH10E5 Grab Sample from Trench Area	AD-SS-DM-01 MH10E6 Drum Sample
	Soil																		
	Industrial	Residential																	
Aluminum (Al)	1,000,000 N	78,000 N	29,000 - 116,000	11,300	8,790	7,270	8,830	10,800	7,780	4,240	3,390	6,390	7,170	6,130	8,990	3,960	4,360	315
Antimony (Sb)	410 N	31 N	0.22 - 1.01	12.4 UJ	12.4 UJ	12.3 UJ	12.4 UJ	12.5 UJ	12.5 UJ	12.6 UJ	12.2 UJ	16.2 UJ	12.3 UJ	12.4 UJ	12.4 UJ	12.2 UJ	12.6 UJ	15.0 UJ
Arsenic (As)	1.9 C	0.43 C	2.8 - 10.9	**6.1**	**4.8**	**4.3**	**5.3**	**5.4**	**4.2**	**4.5 J-**	**3.5 J-**	**4.7 J-**	**5.2**	**5.6**	**5.0 J-**	3.0 UJ	**3.4 J-**	3.7 U
Barium (Ba)	72,000 N	5,500 N	337 - 998	229	256	320	224	218	329	244	247	252	234	189	216	234	740	3.9 J-
Beryllium (Be)	2,000 N	160 N	0.3 - 1.56	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.3 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.1 UJ	1.2 UJ
Cadmium (Cd)	510 N	39 N	0.01 - 2.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U	0.11 J
Calcium (Ca)				20,100	24,000	15,000	22,800	28,400	28,100	29,800	23,100	16,100	11,800	16,200	13,800	22,700	30,200	1250 U
Chromium (Cr)			91 - 90	18.0	14.3	10.1	12.5	14.9	12.1	8.8	6.9	10.8	9.4	9.8	13.8	7.9	10.5	2.5 U
Cobalt (Co)	20,000 N	1,600 N	3.6 - 14	10.3 U	10.3 U	10.2 U	10.3 U	10.4 U	10.4 U	6.6 J-	5.3 J-	6.4 J-	6.7 J-	6.8 J-	7.9 J-	5.2 J-	6.9 J-	0.15 J-
Copper (Cu)	41,000 N	3,100 N	10 - 43	25.5	9.5	11.3	13.0	15.3	12.0	7.9	5.4	8.9	12.8	15.3	17.4	5.7	5.1 J	3.8 J
Iron (Fe)	310,000 N	23,000 N	10,600 - 41,000	17,700	15,600	11,000	14,500	15,900	17,500	14,700	10,300	14,400	12,900	13,300	17,800	10,300	12,900	6,680
Lead (Pb)			9 - 31	185	7.8	7.9	13.5	13.8	10.0	6.2 J-	4.7 J-	9.9 J-	9.0 J-	8.3 J-	21.9 J-	4.5 J-	4.6 J-	2.0 J
Magnesium (Mg)				8,640	11,500	8,770	9,010	9,280	10,100	11,400	11,300	8,440	6,270	10,300	8,250	11,400	13,500	1250 U
Manganese (Mn)	20,000 N	1,600 N	192 - 752	496	421	398	454	417	595	501	367	422	389	457	464	345	475	27.0
Mercury (Hg)			0.02 - 0.11	0.044 J	0.10 U	0.032 J	0.073 J	0.055 J	0.039 J	0.10 U	0.10 U	0.14 U	0.10 U	0.037 J	0.041 J	0.10 U	0.10 U	0.12 U
Nickel (Ni)	20,000 N	1,600 N	7 - 32	19.9	19.2	15.2	17.3	19.5	17.8	14.7	11.4	13.7	16.4	16.8	19.9	11.4	14.9	1.6 J
Potassium (K)				2,520	1,720	1,650	1,970	2,360	1,840	1,290	1,180	1,810	1,750	1,800	2,240	1,340	1,270	583 J-
Selenium (Se)	5,100 N	390 N	0.09 - 0.56	7.2 U	7.2 U	7.2 U	7.2 U	7.3 U	7.3 U	1.3 J+	7.1 U	9.4 U	1.4 J+	1.1 J+	1.1 J+	7.1 U	1.6 J+	8.7 U
Silver (Ag)	5,100 N	390 N	0.01 - 8	2.1 UJ	2.1 UJ	2.0 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.0 UJ	2.7 UJ	2.0 UJ	0.08 J-	2.1 UJ	2.0 UJ	2.1 UJ	2.5 U
Sodium (Na)				1,030 U	1,540	1,260	1,030 U	1,040 U	1,650	992 J	332 J+	585 J+	1,360	5,250	1,340	500 J+	1,190	223,000
Thallium (Tl)	72 N	5.5 N	0.1 - 0.8	5.1 U	5.1 U	5.1 U	5.1 U	5.2 U	5.2 U	2.2 J+	1.8 J+	2.3 J+	1.9 J+	2.0 J+	2.2 J+	1.9 J+	1.8 J+	0.51 J
Vanadium (V)	310 N	23 N	36 - 136	**23.9**	**24.7**	17.2	22.9	**26.7**	22.2	16.8	13.6	20.2	19.8	14.8	21.7	14.5	18.5	0.23 J+
Zinc (Zn)	310,000 N	23,000 N	31 - 98	133	48.9	41.9	66.0	56.5	61.8	36.6 J	27.3 J	38.2 J	35.7 J	41.6 J	68.6 J	27.0 J	31.5 J	620 J

J	The associated numerical value is an estimated quantity and is the approximate concentration of the analyte in the sample
J+	The associated numerical value is an estimated quantity but the result may be biased high.
J-	The associated numerical value is an estimated quantity but the result may be biased low.
UJ	The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound may or may not be present in the sample
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RBCs	Risk Based Concentrations
C	Carcinogenic effects
N	Noncarcinogenic effects
Bold	Analytical results that exceed the RBCs.

APPENDIX A

Photolog

PHOTO 1
Agency Dump site, trench area.

PHOTO 2
Drainage channel from the trench area.

PHOTO 3
Agency Dump site, trench area.

PHOTO 4
Agency Dump site, trench area.

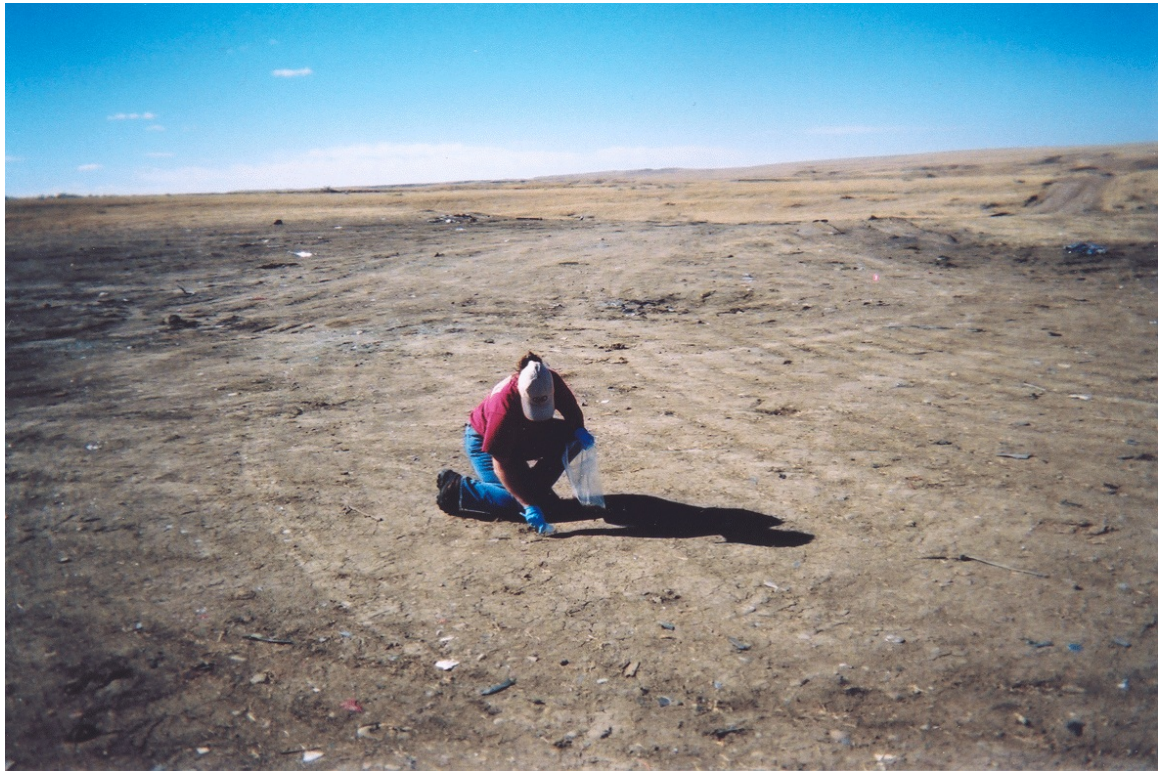

PHOTO 5
Collecting Samples from the trench area.

PHOTO 6
Agency Dump site, sink hole in the trench area.r

PHOTO 7
Surficial debris in the debris area.

PHOTO 8
Sample location AD-SO-DB-02.

PHOTO 9
Sample location AD-SO-DB-02.

PHOTO 10
Sample location AD-SE-DP-01.

PHOTO 11
Geoprobe® activities.

PHOTO 12
Sample location AD-SS-DM-01.

PHOTO 13
Sample location AD-SS-DM-01.

PHOTO 14
START2 collecting sample AD-SS-DM-01.

PHOTO 15
Sample location AD-SS-AS-01.